

## METHOD AND ARTICLE FOR CONCENTRATING FIELDS AT SENSE LAYERS

### The Field of the Invention

5 The present invention generally relates to magnetic random access memory (MRAM) devices. More particularly, the present invention relates to ferromagnetic cladding for concentrating a magnetic field at a sense layer.

### Background of the Invention

10 An MRAM device includes an array of memory cells. The typical magnetic memory cell includes a layer of magnetic film in which the magnetization is alterable and a layer of magnetic film in which the magnetization is fixed or “pinned” in a particular direction. The magnetic film having alterable magnetization may be referred to as a data storage layer or sense  
15 layer and the magnetic film which is pinned may be referred to as a reference layer.

Conductive traces (commonly referred to as word lines and bit lines) are routed across the array of memory cells. Word lines extend along rows of memory cells, and bit lines extend along columns of memory cells. Because  
20 the word lines and bit lines operate in combination to switch the orientation of magnetization of the selected memory cell (i.e., to write the memory cell) the word lines and bit lines can be collectively referred to as write lines. Additionally, the write lines can also be used to read the logic values stored in the memory cell.

25 Located at each intersection of a word line and a bit line is a memory cell. Each memory cell stores a bit information as an orientation of a magnetization. Typically, the orientation of magnetization in the data storage layer aligns along an axis of the data storage layer that is commonly referred to as its easy axis. External magnetic fields are applied to flip the orientation of  
30 magnetization in the data storage layer along its easy axis to either a parallel or